Small-scale Forest Economics, *Management and Policy*, 1(1): 103–117, 2002

Cabinet-makers' Awareness and Usage of Rainforest Cabinet Timbers in Queensland [1]

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This paper reports findings of surveys into the usage of, and attitudes to, rainforest cabinet timbers by cabinet-makers in Queensland, Australia. In determining policies to promote growing of native rainforest trees on private land, it is necessary to know the market requirements for various cabinet species. The species most in demand by cabinet-makers are identified in this paper. Suitability and availability are found to be important determinants of cabinet-maker demand for timber. The species being planted in north Queensland are not a close match with those predicted by cabinet-makers to be in greatest demand in the future.

INTRODUCTION

The listing of the Wet Tropics of Queensland World Heritage Area (WTWHA) in 1988 resulted in a marked decrease in the resource of rainforest cabinet timbers available for harvest. Establishment of the Community Rainforest Reforestation Program (CRRP) by all three levels of government, was an attempt to re-establish a cabinet timber industry in north Queensland. Associated with increasing community concern about the environment, there has been a high level of interest by landholders in growing native timber species, particularly on degraded farmland in areas of moderate to high rainfall in Queensland and northern New South Wales. These regions have some of the finest furniture species found anywhere in the world, sometimes referred to as 'diamond timbers', with local names such as Red Cedar, Queensland Maple and Silky Oak.

Unexpectedly high attendance rates at farm forestry conferences such as the two Managing and Growing Trees on Farms training conferences run by the Department of Primary Industries and other government agencies in 1996 and 1998 where tree farming practices for these species were explained, show support in the farming

[1] The authors are members of the Rainforest CRC, the financial support of which has made the research reported here possible.

community for planting these species. Considerable experience has now been gained on how to grow these rainforest species and many landholders have established small plantations or woodlots**.** In north Queensland there is currently about 2300 ha of farm woodlots, of which nearly 90% are native hardwoods (Wood *et al*. 2001). However, more knowledge needs to be accumulated on silviculture of preferred species.

Farm forestry based on native timber species is potentially a profitable enterprise, which can have major externality benefits, such as watershed protection, wildlife habitat and carbon sequestration. However, disincentives are that the payback period is typically 30 years or more, technical advice on native species is limited by the neglect of these species in government plantations (with the exception of Hoop Pine), and yield and price and thus profit uncertainty are high. Initially, about 100 tree species were included in CRRP plantings, and while a narrower range of species is now favoured in farm forestry, there is still a lack of information on aspects such are potential yields, silviculture and market prospects of the species being grown. Attempts have been made to predict growth rates and future prices of native timbers (e.g. see Russell *et al*. 1993, Herbohn *et al*. 1999). These studies have elicited opinions of forestry production experts, but have paid little attention to timber marketing and processing.

To obtain information on the market prospects for native rainforest and eucalypt timber species, interview surveys of cabinet-makers were conducted in Cairns, Townsville and Brisbane. Survey-based research was also carried out into workers in cabinet-making firms and the community as purchasers of timber products, the latter being reported by Smorfitt *et al*. (2001). The study reported here is confined to timber usage in furniture and kitchen applications, and was designed to assist in species choice for farm plantings. Cabinet-makers' awareness of native timbers, views about timber properties and usage, and the relative importance of factors in their decisions to use particular species were investigated. The following section outlines the research method employed. Findings of the survey are then discussed and implications are drawn for reforestation activities.

SURVEY DESIGN AND METHOD

Cabinet-maker firms are defined here as any firms involved in the construction, manufacture or installation of furniture, kitchens and other cabinets or fittings, manufactured predominantly from timber or other wood-based products. Cabinet makers are defined to include owners or managers of cabinet-making firms, as well as tradespersons and apprentices employed by these firms. Retailers of manufactured products are specifically excluded. For the Townsville survey, a list of cabinet making covered by the (previous) 077 telephone code areas (covering Townsville, Mount Isa, Cloncurry and Hughenden districts) was compiled from the Telstra Yellow Pages. The list was separated into two broad groups, Townsville city area and Townsville outlying area. For the Cairns group, firms in the 070 telephone code areas were sampled, with coverage from Hinchinbrook in the south, Georgetown in the west and Weipa in the north west. Firms in Brisbane were limited to the Brisbane city area, with postal codes of 4000 to 4199.

A common questionnaire was developed for the three groups. The first section

included questions on personal information (gender, age, education levels and work experience). A section covered cabinet-makers' ratings of specific factors in the choice of timber species (price, colour and grain, availability, customer requests and suitability for purpose) on a five-point importance scale. A list of species was presented to elicit views on which species should be planted to satisfy future timber requirements. Finally, questions were included on awareness, usage and suitability for three purposes (furniture, kitchen benchtops and kitchen cabinet doors). Comments for refining the questionnaire were obtained from members of the North Queensland Joint Afforestation Board, Department of Primary Industries (Forestry) and tree nursery industry.

The surveys were carried out during 1997. Interviews were arranged with managers of firms or their nominated representatives, as well as employees with cabinet making skills. The first author and an assistant carried out the Cairns and Townsville city interviews, both participating in the first five interviews to ensure consistency of interview procedures. Postal surveys were used in the Townsville and Cairns outlying areas, due to the small number and wide dispersion of potential respondents. Research assistants carried personal interviews in Brisbane. Where timing problems arose for personal interviews, questionnaires were administered on a 'drop off and postal return' basis. Provision was made for recording comments by cabinet-makers on issues not covered in the questions. When arranging interviews and return of drop-off questionnaires, follow-ups were made by letter and telephone call, in an attempt to achieve as high a response rate as possible. During the survey process, some firms were identified as not falling within the definition of 'cabinet-making firm' adopted in this study and were subsequently excluded from the sample. Response rates of 53%, 49% and 31% were achieved for firms in the Cairns, Townsville and Brisbane areas respectively. Further details of response rates and sampling frames for each area can be found in Herbohn *et al*. (1997), Smorfitt *et al*. (1997) and Peterson *et al*. (1997).

SURVEY FINDINGS

Personal characteristics of cabinet-makers

The age distribution of respondents is indicated in Table 1. Approximately 90% were aged less than 50 years in Townsville and Cairns, and 80% in Brisbane. Less than 5% of the respondents were female.

As indicated in Table 2, the majority of cabinet-makers have qualified with a trade (68% overall and 74% in Cairns), with only a small proportion having undertaken tertiary qualifications (3%).

Customer advice and factors affecting timber input decisions

Prior information indicated that choice of timber species for made-to-order items depends on a number of factors, including cabinet-makers' experience, customer preferences, timber suitability for purpose, timber availability and timber price, while customer preference is influenced by timber appearance, such as colour and grain. As indicated in Table 3, the majority of cabinet-makers (over 60% in each city) indicated that they assist or advise clients on which timber to use for particular tasks. The proportion providing advice was slightly lower in Brisbane than north

Queensland, although the differences were not statistically significant (p = 0.427). Chi-squared testing on cross tabulations reveal that there is a significantly larger (P<0.000) proportion of cabinet-makers with a trade or tertiary qualification offering advice on the choice of species compared to those with lower education and training qualifications (74% compared with 43% respectively). This would suggest that the most effective promotion of rainforest cabinet timbers would be targeted at trade and tertiary qualified cabinet-makers, either post-qualification or during training.

Table 1. Age distribution of cabinet-makers

Age class	Townsville		Cairns		Brisbane	
	No.	%	No.	%	No.	%
<20 years	4	9.5	4	7.1	3	4.2
20 – 29 years	13	31.0	15	26.8	27	37.5
30 – 39 years	7	16.7	19	34.0	18	25.0
40 – 49 years	13	30.9	13	23.2	10	13.9
50 – 59 years	4	9.5	4	7.1	8	11.1
60 – 69 years	1	2.4	1	1.8	6	8.3
Total	42	100.0	56	100.0	72	100.0
Unknown	3		1		2	
Total number of known respondents = 170						

Table 2. Education and training levels

Education level	Townsville		Cairns		Brisbane	
	No.	%	No.	%	No.	%
Primary	0	0.0	1	1.8	1	1.4
Junior	10	25.0	6	10.5	10	13.7
Senior	4	10.0	6	10.5	8	11.0
Trade	25	62.5	42	73.7	49	67.1
Tertiary	1	2.5	2	3.5	5	6.8
Total	40	100.0	57	100.0	73	100.0
Unknown	5		0		1	
Total number of known respondents = 170						

Table 3. Frequency with which cabinet-makers in Townsville, Cairns and Brisbane advise customers on species to use for a particular task.

Level of education/training	Advice given to customers	
	Yes	No
Secondary or lower	19	25
Trade or tertiary	90	32
Total	99	57

Table 4 presents cabinet-maker ratings of the influence of various factors on their decision to use particular timber species. (Data were not obtained for Townsville city where the questionnaire was first deployed.) Scores reported are averages on a 5-point Likert scale (1 for very little influence through to 5 for very strong influence).

Table 4. Cabinet-makers average rating of the influence that specified factors have on their decision to use a particular timber for the task at hand

Location	Price	Consistency of colour and grain	Availability	Customer request	Suitability	No. of responses
Townsville outlying	3.4	3.9	4.3	3.9	4.6	8
Cairns	3.2	3.9	4.1	4.2	4.4	57
Townsville outlying and Cairns combined	3.3	3.9	4.1	4.2	4.4	65
Brisbane	3.0	3.7	3.8	3.9	4.2	74
All groups	3.1	3.8	4.0	4.1	4.3	139

Suitability concerns how well a particular species matches the job requirements, e.g. for bench tops the timber would need to have high density and durability. Suitability was the most highly rated factor by all groups, with an overall mean rating of 4.3. More than 80% of the respondents rated 'suitability' as having a 'strong' or 'very strong' influence on their decision to use a particular timber.

Requests from customers were also important in choice of species. This is simply giving the customer what they want a basic element of marketing. It should however be noted that cabinet-makers will influence the customers' decisions by providing expert advice about timber properties of alternative rainforest species. Meeting customers' requirements appears to be of greater concern for cabinet-makers in North Queensland (where 81% rated it as a very strong or strong influence) compared to Brisbane (67%). This difference may be partly explained by the different nature of the markets. The Brisbane cabinet-making firms may have less need to be flexible and respond to customer demand because of the greater size of

the market and hence the availability of other clients and the associated ability to specialise. Regional tradesmen do not have the same flexibility because their client base is more limited.

Availability of particular species closely matched the above factors in importance, reflecting the unreliable supply of individual cabinet timber species following cessation of rainforest logging on Queensland Crown land. During discussions, cabinet-makers indicated that they hold little inventory of solid timbers and thus need to be able to access the timbers once an order is received (a just-in-time inventory method). The lower rating accorded availability by Brisbane cabinet-makers may be due to their more extensive use of composite wood products which are generally available on request (Peterson *et al.* 1997).

Consistency of colour and grain was also ranked highly. This property is important for aesthetic appeal of the timbers and thus the final product. Grain and colour will play a large part in customers' requests for particular species, and are relevant in terms of ease of working and hence production cost. If high levels of consistency of colour and grain are achievable, inventory left over from previous jobs can be used with resultant cost saving.

Relative to other factors, *price* had a low influence on species choice. It is to be borne in mind that these are cabinet-makers' ratings, and that customers' budget constraints could also be translated through their species requests. While this may to some extent reflect the lower percentage of Brisbane cabinet-makers who advise clients on species choice and greater use of composite timbers, it could also reflect a larger market and more customers with high disposable incomes.

Rating of timber species

Approximately one million trees have been planted in the CRRP, and it is of interest to compare the species planted with those judged by Cairns cabinet-makers as most likely to be in demand in the future. A list of 50 native rainforest and eucalypt species was presented to cabinet-makers, who were asked to rank species on a 5-point Likert scale, from 1 (not recommended) through to 5 (very highly recommended). Responses are summarised in Table 5. This table also reports a composite 'recommendations index', as the mean ranking on the five point scale. The frequency of responses for each species is also indicated, since reservations would have to be held about planting species only recommended by a small number of cabinet-makers.

The five species most highly recommended by Cairns cabinet-makers (with mean ranks of 4.0 or greater) are all rainforest species – Northern Silky Oak,[2] Queensland Maple, Red Cedar, Queensland Walnut and Maple Silkwood. It is notable that only one eucalypt, Tasmanian Oak, is included in this list; this trade name is in fact applied to *E. regnans* and several other eucalypt species. The popularity of Flindersia species is apparent, with four of these included in the top 11 (Qld. Maple, Maple Silkwood and two Silver Ash species). Hoop Pine, which is the only species grown widely in DPI Forestry plantations, is ranked 19th in the list.

[2] This is the species *Cardwellia sublimis*, as distinct from the better known Southern Silky Oak (*Grevillia robusta*).

Table 5. Cabinet-makers' species recommendations for planting to meet future timber requirements, Cairns group

Species	Rank	Not rec.	Indifferent	Rec.	Highly rec.	Very highly rec.	Mean score	No. of responses
		1	2	3	4	5		
Northern Silky Oak	1	1	0	6	10	36	4.51	5
Queensland Maple	2	0	0	8	12	35	4.49	55
Red Cedar	3	0	3	7	11	33	4.37	54
Queensland Walnut	4	1	1	9	11	31	4.32	53
Maple Silkwood	5	0	4	10	10	22	4.09	46
Tasmanian Oak	6	1	2	14	21	17	3.93	55
Northern Silver Ash	7	0	8	13	15	19	3.82	55
Red Siris	8	4	4	5	16	15	3.77	44
Red Silkwood	9	0	6	15	15	14	3.74	50
Satin Silky Oak	10	1	4	18	9	16	3.73	48
Qld Silver Ash	11	0	7	18	12	17	3.72	54
Black Wattle	12	2	5	17	14	16	3.69	54
Kauri Pine	13	1	7	18	12	17	3.67	55
Silver Quandong	14	0	9	11	11	12	3.60	43
Black Bean	15	0	7	21	14	13	3.60	55
Brown Salwood	16	1	6	12	11	8	3.50	38
Northern Scentless Rosewood	17	1	6	19	10	9	3.44	45
Rose Mahogany	18	0	6	18	10	6	3.40	40
Hoop Pine	19	0	11	23	9	11	3.37	54
Northern Brush Mahogany	20	2	8	16	9	8	3.30	43
Hickory Ash	21	2	6	15	7	7	3.30	37
Red Mahogany	22	0	10	17	6	8	3.29	41
Brown Quandong	23	2	8	16	11	5	3.21	42

Species	Rank	Not rec.	Indifferent	Rec.	Highly rec.	Very highly rec.	Mean score	No. of responses
		1	2	3	4	5		
White Beech	24	1	7	19	13	2	3.19	42
Spur Mahogany	25	0	11	8	11	3	3.18	33
Silver Silkwood	26	2	10	9	8	6	3.17	35
Satin Sycamore	27	3	8	17	7	6	3.12	41
Rose Alder	28	3	10	13	9	5	3.08	40
River Red Gum	29	1	10	16	1	6	3.03	34
White Mahogany	30	1	8	8	8	1	3.00	26
Forest Red Gum	31	3	10	9	7	3	2.91	32
Johnson River Hardwood	32	8	11	12	8	7	2.89	46
Lemon Scented Gum	33	3	12	12	2	5	2.82	34
Boonjie Blush Walnut	34	5	10	10	4	4	2.76	33
Rose Butternut	35	2	12	8	3	3	2.75	28
Rose Gum	36	2	11	13	3	2	2.74	31
Brown Pine	37	4	12	11	5	2	2.68	34
Tallowwood	38	7	7	5	5	3	2.63	27
Magnolia	39	2	13	7	1	3	2.62	26
Gympie Messmate	40	3	8	2	2	2	2.53	17
Canary Beech	41	2	12	6	3	0	2.43	23
White Cheesewood	42	4	9	4	3	1	2.43	21
Grey Ironbark	43	7	9	8	2	2	2.39	28
Blush Alder	44	4	11	8	3	0	2.38	26
Black Pine	45	5	7	11	0	1	2.38	24
Nutmeg	46	4	10	5	2	1	2.36	22
Bolly Silkwood	47	4	10	5	1	1	2.29	21
Penda	48	9	14	8	3	1	2.23	35
Rose Marara	49	2	10	3	1	0	2.19	16
Damson	50	3	6	4	0	0	2.08	13

In Table 6, the 15 species most highly recommended by Cairns cabinet-makers and some of the other well-known species are compared with Brisbane recommendations and CRRP plantings up to 1996. There are marked differences in species recommendations by cabinet-makers between north and south Queensland. For Brisbane, Tasmanian Oak leads the list, followed by Red Cedar, Hoop Pine, Queensland Maple, Northern Silky Oak, Queensland Walnut then the two Silver Ash species. The prominence of Tasmanian Oak and Hoop Pine is probably associated with their ready availability and tradition of use. Furthermore, both have marketing associations, e.g Arakaria Australia actively markets Hoop Pine.

Table 6 reveals that few of the most highly recommended species have been planted to any extent in the CRRP. Of the five ranked most highly by Cairns cabinet-makers, only one (Qld. Maple) was planted to any extent (7.7% of CRRP plantings). Further down the list, Kauri Pine (13th), Hoop Pine (19th) and Red Mahogany (a eucalypt, 22nd) have also been widely planted.

Species awareness and usage

Cabinet-makers were also asked about their knowledge of and attitudes to rainforest and eucalypt species. Responses for the Cairns sample are summarised in Table 7. When asked 'Have you heard of this timber?' most responded in the affirmative for most species mentioned, and it was clear that they had used many of the species. Answers concerning whether they would be willing to use these species in the future were more variable. The Townsville sample exhibited a similar pattern, while in the Brisbane sample there was again strong awareness of rainforest species, and willingness to use them, but a much lower proportion had used these species in the last year.

Timber suitability for specific purposes

Cabinet-makers were asked their opinions about the suitability of species for particular applications, on a 5-point scale (1 for very poor through to 5 for highly suitable). Responses for the Cairns sample are presented in Table 8. (Only those species with a minimum of 10 responses are listed.) A high ranking for Queensland Maple, Red Cedar, Black Bean, Northern Silky Oak and Blackwood, as well as the imported 'Oaks', for furniture and doors is apparent. Jarrah, Blackwood and Black Bean were most favoured for kitchen benches. Hoop Pine and exotic conifers were not well thought of for these purposes. Similar rankings were obtained for Brisbane, except that Red Mahogany was more highly ranked for furniture and doors.

DISCUSSION

Among landholders there is a high level of enthusiasm for and accumulating experience about growing native tree species for timber production and environmental purposes. As well, there is wide interest and experience in use of native rainforest and eucalypt timbers amongst cabinet-makers, particularly those in north Queensland. The vast majority of cabinet-makers have indicated, even in instances where they have not used a species before, a willingness to use the species. The implication is that, if a species is available in appropriate quantities, is appropriate to the task at hand and is acceptable to customers, cabinet-makers would

Table 6. Comparison of Cairns and Brisbane cabinet-makers' top 15 species recommendations against CRRP plantings

Species	Cairns ranking	Brisbane ranking	Proportion of Cairns respondents who rated the timbers as highly or very highly recommended (%)	Proportion of Brisbane respondents who rated the timbers as highly or very highly recommended (%)	Species plantings relative to total CRRP plantings (%)
Northern Silky Oak	1	5	82.1	70.0	0.5
Queensland Maple	2	4	83.9	77.1	7.7
Red Cedar	3	2	78.6	67.1	0.2
Qld Walnut	4	6	75.0	60.0	*
Maple Silkwood	5	16	57.1		1.4
Tasmanian Oak	6	1	67.9	51.4	**
Northern Silver Ash	7	7	60.7	45.7	1.8
Red Siris	8	21	55.4		2.1
Red Silkwood	9	18	51.8		*
Satin Silky Oak	10	12	44.6	27.2	*
Queensland Silver Ash	11	8	51.8	38.6	1.4
Black Wattle	12	13	53.6	47.1	2.1
Kauri Pine	13	14	51.8	49.4	6.0
Silver Quandong	14		55.4		
Black Bean	15	11	48.2	48.6	2.6
Rose Mahogany	18	9		48.6	*
Hoop Pine	19	3	35.7	28.6	10.3
Red Mahogany	22	10		38.6	12.7
White Beech	24	15		25.7	0.3

* Species either not in the planting list or less than 1000 planted.

** Multiple eucalyptus species.

Table 7. Cairns cabinet-makers' awareness of timber species as indicated by their familiarity, use, willingness to use and use in the past 12 months (n = 57)

Species	Familiar	Used	Willing to use			No. who used in the last year as a % of those who have used	No. who used in the last year as a % of responses
	Yes (%)	No (%)	Yes (%)	No (%)	No response (%)		
Australian Rainforest Timber							
Red Cedar	100.0	94.7	93.0	5.3	1.8	66.7	63.2
Qld Maple	96.5	89.5	93.0	0.0	7.0	54.9	49.1
Silver / Blue Quandong	73.7	43.9	73.7	5.3	21.1	28.0	12.3
Acacia Cedar	75.4	45.6	71.9	5.3	22.8	38.5	17.5
Kauri	94.7	80.7	89.5	1.8	8.8	52.2	42.1
Black Bean	100.0	93.0	94.7	0.0	5.3	47.2	43.9
Rose Butternut	42.1	15.8	43.9	10.5	15.6	33.3	5.2
Qld Silver Ash	96.5	75.4	77.2	3.5	19.3	39.5	29.8
Damson	17.5	3.5	31.6	8.8	59.6	50.0	1.7
Cairns Hickory/ Hickory Ash	61.4	33.3	57.9	1.8	40.4	21.1	7.0
Hoop Pine	98.2	84.2	87.7	3.5	8.8	56.3	47.4
Northern Silky Oak	94.7	94.7	87.7	1.8	10.5	72.2	68.4
Brown Salwood	36.8	22.8	45.6	8.8	45.6	61.5	14.0
Australian Grown Exotic Plantation Timbers							
Radiata Pine	100.0	96.5	87.7	8.8	3.5	69.1	66.7
Caribbean Pine	40.4	15.8	42.1	10.5	47.4	22.2	3.5

Species	Familiar	Used	Willing to use			No. who used in the last year as a % of those who have used	No. who used in the last year as a % of responses
	Yes (%)	No (%)	Yes (%)	No (%)	No response (%)		
Other Australian Timbers							
Blackwood (Tasmanian)	89.5	77.2	75.4	1.8	22.8	54.5	42.1
Tasmanian Oak	100.0	98.2	91.2	7.0	1.8	78.6	77.2
Rose Gum	54.4	26.3	40.4	8.8	50.9	20.0	5.3
Red Mahogany	78.9	36.8	56.1	5.3	38.6	33.3	12.3
Rosewood (Coachwood)	86.0	50.9	68.4	3.5	28.1	34.5	17.5
Jarrah	98.2	80.7	84.2	0.0	15.8	50.0	40.4
Gympie Messmate	26.3	10.5	31.6	10.5	57.9	33.3	3.5
Lemon Scented (Spotted) Gum	50.9	22.8	43.9	12.3	43.9	30.8	7.0
Imported Timbers							
Meranti	96.5	91.2	82.5	10.5	7.0	69.2	63.2
Kwila (Qwila)	96.5	86.0	77.2	8.8	14.0	73.5	63.2
American White Oak	71.9	57.9	68.4	10.5	21.1	51.5	29.8
Brazilian Oak (Imported Silky Oak)	57.9	36.8	57.9	10.5	31.6	52.4	19.3
Oregon Pine	93.0	78.9	78.9	7.0	14.0	35.6	28.1

Table 8. Cairns cabinet-makers' assessment of species suitability to specified tasks

Species	Average rating (Max. = 5) [a]		
	Furniture	Kitchen benchtops	Kitchen cabinet doors
Australian Rainforest Timbers			
Red Cedar	4.2	1.3	3.8
Queensland Maple	4.5	3.4	4.3
Silver / Blue Quandong	3.5	2.2	3.5
Acacia Cedar	3.3	3.1	3.4
Kauri	3.7	1.9	3.8
Black Bean	4.2	4.2	4.2
Rose Butternut	2.8	2.1	2.9
Qld Silver Ash	3.8	3.7	3.9
Cairns Hickory/ Hickory Ash	2.5	3.7	2.5
Hoop Pine	3.5	2.0	3.5
Northern Silky Oak	4.4	3.7	4.5
Brown Salwood	3.4	2.9	3.3
Australian Grown Exotic Plantation timbers			
Radiata Pine	2.8	1.9	3.1
Caribaea Pine	2.3	1.7	2.5
Other Australian Timbers			
Blackwood (Tasmanian)	4.1	4.0	4.3
Tasmanian Oak	4.2	4.1	4.6
Rose Gum	2.9	3.3	3.1
Red Mahogany	3.4	3.1	3.3
Rosewood (Coachwood)	3.8	3.1	3.7
Jarrah	4.0	4.6	4.2
Gympie Messmate	2.2	3.1	2.4
Lemon Scented (Spotted) Gum	2.4	3.2	2.0
Imported Timbers			
American White Oak	4.1	3.9	4.3
Brazilian Oak (Imported Silky Oak)	4.1	3.4	4.3
Oregon Pine	2.9	2.4	2.3

[a] At least 10 observations were available for all species except Gympie Messmate.

be willing to use that species. The implication for the farm forestry industry is that it is likely that local markets will exist for timber providing it meet these criteria. This would probably apply even to lesser known and used species. This is also of significance if any attempt were made to market North Queensland eucalyptus species under a generic name such as is done with Tasmanian Oak and Victorian Ash.

With the cessation of rainforest logging on Crown land, supplies of cabinet timbers have been limited to private land, small areas in Crown plantations and imports, all of which are likely to decline over time. Resurgence of an industry based on native rainforest timbers is possible in the future, based on plantations predominantly on private land. However, the species which have been planted on private land are not in general those which the industry thinks will be in most demand in the future. This mismatch will undoubtedly limit the level of use of native rainforest timbers in the future. Moreover, there is a risk that cabinet-making skills with timbers will be lost.

Traditionally, DPI Forestry has concentrated research on only one native species (Hoop Pine). The price premium which had been enjoyed by this species seems to have been largely lost with the depression of timber markets in Asia and lower international timber prices. The focus on Hoop Pine is justifiable given that it has high growth rates and a wide range of market uses (e.g. cladding, structural, mouldings and furniture) compared to many other native and exotic species. There is a need for research into the silviculture, wood technology and market prospects of other native timber species. This work has commenced but is in its infancy. Gough *et al*. (1993) compared timber qualities of a number of rainforest species, and Leggate (1998) examined the market potential of eucalypt species. There is some weight to the argument that the efforts in developing farm forestry should be restricted to a limited number of species to allow this type of work to be undertaken.

As well as market prospects, various other factors affect the profitability of growing native timber species, including growth rates, sawn timber recovery rates, and risks of pest, disease and storm damage. As yet there is a lack of biological growth models to predict performance of native species other than Hoop Pine. Of the 15 most highly ranked species, Queensland Maple, the Silver Ash species and Silver Quandong also have high growth rates, as do Hoop Pine and Red Mahogany (a eucalypt), hence these would appear to be promising species to grow in the Wet Tropics.

Reports on cabinet making firms by Herbohn *et al*. (1997), Smorfitt *et al.* (1997) and Peterson *et al*. (1997) indicate the proportion of total furniture production costs made up by the three major cost groups are material (40%), labour (40%) and overheads (20%). Medium and large-sized cabinet-making firms tend to concentrate on mass production of standardised kitchen units using composite wood products and commonly available timber species, thus achieving labour economies of size. If greater volumes of cabinet timbers were available, and firms specialised in their use, similar economies of size might be achieved. Reduced cost per unit for solid timber products could be expected to lead to an increase in affordability and quantity demanded.

Advice given by cabinet-makers appears to have an effect on customer timber choices. Most cabinet-makers gain most of their experience in large firms using predominantly composite timbers, and their time at TAFE as an apprentice may be

the only experience they gain working with solid timber. This can lead to a bias against native timbers in the advice they give to customers. This points to the need for a greater awareness of native timber potentials in TAFE curricula.

The fact that Tasmanian Oak is so highly regarded, given that supplies are sourced mainly from Victoria, implies that regular availability and strong marketing are important factors in timber demand. This suggests that eucalypt species of equivalent quality which grow well in Queensland could also be developed into well-recognized products.

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